A REVIEW OF SCHOOL-BASED INTERVENTIONS FOR THE IMPROVEMENT OF SOCIAL EMOTIONAL SKILLS AND WIDER OUTCOMES OF EDUCATION

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Abstract

This paper presents a review of interventions which have the evidence of impact on students' non-cognitive skills. The review included 3,000 studies out of which 138 studies were found relevant. Only 13 studies could be considered for the final results of the review process. Aggregating the results from the selected studies, we conclude that there is weak but positive evidence that some non-cognitive skills can be improved by school-based interventions. The most effective interventions involved schools and parent collaboration, freedom for students to communicate and express their feelings and regular implementation of the interventions. However, there is very less evidence concerning the persistence of intervention effects and to what extent they contribute to students' life-long achievements.

Keywords: Non-cognitive skills, school-based interventions, effect sizes, systematic review

Educational research generally focuses on ways to improve academic attainment. The knowledge about the interventions which improve the non-cognitive domains is quite limited compared to the existing evidence available on approaches for cognitive outcomes. This is mainly because performance in cognitive tasks such as performance in academic tests, mainly determine path-ways of occupational success. In addition, it has been supported that the non-cognitive skills are difficult to measure because they are more heterogeneous than cognitive skills and their measurement is based mostly on self-reports and observations (Brunello & Schlotter, 2011). This paper reviews the existing evidence on interventions which improve the non-cognitive skills as a learning domain since these skills 'matter for their own sake' (Garcia, 2014,p 3)

In England, students' behavior and social skills in schools are judged as one of the school effectiveness criterions (Ofsted, 2015). Similarly, some charter schools in United States have adopted the school effectiveness models based on students' performance on non-cognitive measures such as conscientiousness, self-control and resilience (West et al. 2014). Assessment of school performance on these non-cognitive measures can be justified in view of the evidence that shows students who struggle to communicate effectively are likely to be at risk of social isolation, rejection and victim of bullying (Botting & Conti-Ramsden, 2000; Knox & Conti-Ramsden, 2003; Hartshorne, 2007). Longitudinal studies have shown that children having social emotional and behavioural challenges in the primary school age are less likely to achieve good results in school (Patalay, Fink, Fonagy & Deighton, 2016), less likely to attain higher education qualification, more likely to be involved in crime and are at higher risk of poor health, drug addiction, depression and other mental health problems (Carneiro, Crawford & Goodman, 2007, p.6). Children good in social skills are more engaged in schools and have positive friendship clusters (Gutman & Vorhaus, 2012).

Non-cognitive are considered crucial for the life-long outcomes and have been found associated with domains, such as cognitive skill development (Blair & Rever, 2014; Heckman & Kautz, 2013; Tierney, Grossman, & Resch, 1995) and the labour market outcomes (Acosta, Muller & Sarzosa, 2015). Research studies have reported that non-cognitive skills play a key role in the attainment outcomes between different social groups and thus can be related with social inequalities since earlier academic stages (Noden & West, 2009). Furthermore, non-cognitive skills can be a predictor for adult criminality (Agan, 2011), health (McCord, 1978) or admission into higher education (González-Torres et al., 2014; West et al., 2014). For example, a follow-up of the Seattle Social Development Programme has used social behaviour in childhood as a predictor of positive adult functioning and preventing mental health problems and substance abuse (Hawkins et al., 2005).

England in comparison with other OECD countries is at the bottom of the list where children aged 10 to 12 years report their life satisfaction at school and their relationship with teachers (The Children's Society, 2015). Only 26% of English students fully agreed with the statement 'I like going to schools' and 38% reported been hit by other children. Even though this finding is based on children's subjective reporting and sometimes contradicts with objective measures of children's well-being, it urges the development of non-cognitive skills of students.

There is evidence suggesting that early age social skills have positive correlation with later outcomes in life such as employment status and hourly wages. It is found more so

important and effective for success and life chances of people born in poverty (Carneiro, Crawford & Goodman, 2007). Social skills and social connectedness in early years are also found better determinants of well-being in adulthood life rather than academic achievement in school (Olsson, McGee, Nada-Raja & Williams, 2013). Supportive peers, school environment and community develop characteristics that are associated with nurturing good social skills and effective communication behaviour. In particular, active engagement with school (or school connectedness) is thought to be inversely linked with risk-taking behaviours. Schools are a micro-society for children where they learn about trust, mutual respect and expectations from a wider society (Gorard and Smith 2010). Therefore, it is crucial that school policies should focus on readiness of children to meet the wider social world.

Therefore, these skills are crucial to be developed and this review examines school-based interventions that have published reporting impacts on these non-cognitive skills. We use the term skills instead of traits, abilities or constructs because this makes evident that they can be transformed and they are not stable characteristics. Eysenck and Eysenck (1980, p.191) described personality traits as 'importantly determined by hereditary factors'. Therefore, we use the term skills to emphasize the ability to improve these characteristics. In this review, we are just focused on the selected non-cognitive skills that are most often targeted for improvement in the school contexts and the following were examined in this review:

- *Social skills*: This is a broad category and it includes all the skills which concern interaction with other individuals. For instance, working in a team effectively can be considered one of these skills or sociability. There is evidence that social skills are malleable at school age level (Gutman & Schoon, 2013).
- *Grit/Resilience:* Grit can be defined as 'perservance and passion for long-term goals [...] maintaining effort and interest over years despite failure, adversity, and plateaus in progress' (Duckworth et al. 2007, p. 1087-1088).
- *Emotional wellbeing*: Social and Emotional Learning (SEL) is often described as a single unit by the SEL programmes which targets skills, such as recognition and management of emotions, setting of realistic goals, establishing and maintaining healthy relationships and good decision making mostly, including interpersonal situations (Payton et al. 2008, p.4). By saying emotional stability, we mean mostly the recognition and management of emotions.
- *Motivation and Locus of Control:* Study of motivation refers to 'the determinants of thought and action - it addresses why behaviour is initiated, persists, and stops, as well as what choices are made' (Weiner, 1992, p.17). Locus of control is a concept which is closely associated with motivation. Rotter has suggested a one-dimensional model where locus of control is either external or internal to the person, while Weiner suggested a two-dimensional model where except for the internal and external classification, there is also of classification of causes between stable and unstable (Weiner, 1974). Thus, there are four main causes to success; ability (stable and internal locus of control), task difficulty (stable and external locus of control), effort (unstable to some extent and internal locus of control) and luck (unstable and external locus of control) (Weiner, 1974).
- *Self-efficacy and self-esteem:* According to Bandura (1997) these abilities are about making judgments of 'personal capacity' and 'self-worth' (p. 11).

- *Self-regulation*: According to Zimmerman, Bonner and Kovach (1997, p.11) the self-regulatory learning cycle involves a) self-evaluation and monitoring of the prior performance, b) goal setting and strategic planning, c) strategy implementation to succeed the goal(s) and d) the outcome monitoring. All these stages are associated with learning outcomes.

It is important to acknowledge that these skills could be interrelated and, therefore, interventions could possibly have wider known or unknown impacts. For example, Bandura (1997) links the development of intrinsic motivation and interest through the enhancement of self-efficacy (p.218-223) and discusses the role of self-efficacy in the self-regulated learning (p. 227-234). It has also been supported that the self-regulation gives a sense of personal control which is a major source of intrinsic motivation (Zimmerman, Bonner & Kovach, 1996, p. 3). In other words, non-cognitive skills should be perceived as a grid with links and interdependency between skills. There is no clear and robust evidence that determine if these skills are independent of each other and improvement interventions can have effect on associated skills variably. There is very less evidence that shows if the interdependency can be measured or controlled and how targeted intervention outcomes have impacts on the associated skills.

Method

The research studies of this review were retrieved by several electronic databases; ERIC, EBSCOhost, Google Scholar, Web of Science, Project MUSE, EPPICentre database, SSRN and ProQuest (for dissertations and thesis). For EBSCOhost searching the following databases PsycINFO, Education Abstracts (H.W. Wilson), ERIC, PsycARTICLES, British Education Index, Child Development & Adolescent The syntax was equally compatible for searching in all these electronic databases:

> ((non-cognitive* OR soft* OR character OR attitude* OR personality OR behavio$r* OR social emotional) AND (skill* OR trait* OR abilit*) AND (school*) AND (primary OR elementary OR Key Stage2 OR KS2) AND (classroom* OR teacher*) AND (interven* OR program$ OR approach*) AND (randomi$ed OR trial OR RCT OR experiment* OR cohort OR case match*))

The retrieved results were near 7,000 studies in all. The authors of this paper conducted the search, selection and rejection of the studies according to the pre-specified protocol. The second stage consisted of filtering the retrieved studies by skimming the abstracts or executive summaries. The protocol followed for this stage was to save the studies that clearly state relevance with non-cognitive skill(s) and are based on a robust research design. At this stage, we did not exclude studies that reported academic attainment as the main outcome because a large number programmes for non-cognitive skills have been evaluated for assessing the impact on academic outcomes. As reviewers we shared our database of selected and rejected studies and in case of disagreement we consulted an experienced colleague to review and rate the study according to our protocol. We accepted the third reviewer's decision. There was only one disagreement for which we required third party review.
We recorded brief descriptions of all the studies which were relevant and if the studies reported non-cognitive measures, independent from cognitive measures or academic attainment. We recorded 138 evaluations studies as a result of this process. In the

reference list the selected studies for this systematic review are marked with a (*) in the beginning.

The third stage was to judge the quality of these studies in terms of research design, sample size, attrition, and reported quality of the outcomes. We summarised the 138 studies and graded each study independently on a scoring 0-5 points. We applied the selection criterions based on the Maryland Scale of Scientific Method (Sherman et al., 1997) and the proposal of judging the trustworthiness of the studies put forward by Gorard (2015). According to these two frameworks, there are levels of validity and trustworthiness of the reported findings, which include judgment on the criterions such as research designs, sample size, missing number of cases and completeness of reported data required for independent analysis. We combined both these standardised approaches and developed 6 levels of internal validity for each study. Research with the lowest internal validity belong to level 1, while the studies with the strongest belong to level 5. Level 1 includes those with correlation evidence, while level 5 consists of randomised control trials. The criterion we adopted from combining the two frame works also included level 0 studies. The studies were given level 0 as these were evaluation of non-cognitive interventions but for a different research questions such as improvement in academic attainment, school enrollment, health or attendance but did not report any impact on the non-cognitive skills. In other words, a study level 0 for our study can be a robust randomised control trial (level 5 concerning its internal validity) but does not give any impact measures on non-cognitive skills.

The programme evaluations, which targeted the non-cognitive skills development for students of a specific characteristic such as dyslexia or autism, were judged irrelevant. The current review included interventions that targeted an average mainstream class of students where children of all abilities are mixed.

In this review, the content relevant studies were scored 1to 5 according to the validity of research designs, clear reporting of samples and missing data. Randomised Control Trial studies that reported minimum attrition were graded with 5. Then, studies with matched sample and reported attrition were graded with 4, while quasi-experiments with comparison group (not randomised or matched) and reported low attrition were graded with 3. Studies with comparison group and reported high attrition or not reported attrition were graded 2 to 3. Finally, interventions evaluated without a control group were rated with 2. Literature reviews, papers with meta-analysis and any other type of paper which did not describe an intervention or a survey were graded with 1. All of the selected research studies were graded by two raters and the inter-rater reliability was high, as the scoring system was pre-specified and it covered all the requirements for inclusion in the research. To sum up, the inclusion criteria of the studies were;

- published after 1995
- published in English language
- evaluations of interventions taken place in a school context (school-based)
- conducted with participants aged 6-12 years old
- evaluated with a control group or a comparison group
- reported sufficient information for post-testing, so effect sizes could be calculated (sample sizes, means and standard deviations)
- potentially beneficial for all the students in the classroom and not particular group of students

- targeting the development of specific non-cognitive skills: motivation, social and communication skills, self-regulation, self-esteem, resilience, emotional literacy and wellbeing

The studies with good internal validity could be rejected because the programmes did not target improvement in non-cognitive skills (Hu et al., 2011; Joyce et al., 2015); lacked the description of a implemented programme and evaluation research design (Alan & Ertac, 2014; Gladwell and Barton, 2014); focused on specific group of students, such as children from gypsy communities (Kézdi and Surányi, 2009) or focused on a different age group (Barnett et al., 2008). To sum up, there were some studies which despite the fact were judged appropriate initially, at the final stage were excluded from the analysis. In the next section, the controlled school-based interventions aiming to improve the non-cognitive skills are presented. For each of the included interventions, when the data was sufficient effect size was calculated to demonstrate their effectiveness and make a judgement if these interventions can have non-cognitive gains for the students. The final discussion and conclusion are based on the studies which could be re-analyzed.

Results

This section includes the results and analysis of the studies, which matched with our selection criterions based on the internal validity of the research design. Table 1 shows the results of studies included in the grading review process.

TABLE 1
Grading of Studies

Grades	No. of studies
Studies graded 4 to 5	1
Studies graded 3 to 4	1
Studies graded 3	4
Studies graded with 2 to 3	7
Total Number of Studies whose effect sizes were calculated	13
Studies with good internal validity but poor reporting	24
Total Number of Studies included in the review - judged with good internal validity	37
Total Number of Studies excluded from the review a) studies graded with >2 (Literature review - no trials) b) studies graded with 0 (due to irrelevance)	101
Total Number of Studies examined	138

The selected studies graded higher on internal validity were not necessarily chosen for calculating the effect sizes because the reported facts and figures were not complete to re-calculate and analyse the effect sizes. We could only calculate the effect sizes for 13 studies, which are reported in the Table 2. The conclusions are based on only these13 studies because the quality of the evidence was robust and the reported findings were complete and clearly mentioned to conduct a re-analysis.

Evaluations of the interventions for non-cognitive outcomes

The section below describes some of the interventions that have been evaluated. Some of these interventions are popular in schools have been evaluated more than once. The descriptions of the intervention programmes and the research studies explains the nature of the interventions and the details on the quality and trustworthiness of the reported facts in the studies. Investigating the in-depth details of the individual programme allowed us to understand the common elements among all that resulted in the desired outcomes.

RULER

RULER stands for Recognising emotions in self and others, Understanding the causes and consequences of emotions, Labeling emotions accurately, Expressing emotions appropriately and Regulating emotions effectively (Yale Center for Emotional Intelligence, 2013). As the acronym suggests, these are the RULER skills. RULER introduces the Feeling Words Curriculum, which is a multi-year structured curriculum which can be implemented from kindergarten to middle school and it promotes social, emotional and academic learning (Brackett et al., 2012).

Brackett et al (2012) explored the effect that RULER has on fifth and sixth grade students by using the Behavioural Assessment System for Children (BASC). The study reported the sample of 273 students who could be finally assessed for the programme impact. This excludes nearly 75 students for whom parental consent could be achieved. The total number of drop out cases from the final analysis is not clearly reported. In our scale of 1-5, this study scored between 2 to 3 because it has a comparison group but does not clearly report the student dropout rate. The effect size of 0.50 is promising.

School-based intervention programme following the WHO recommendations

This study (Lemma et al., 2012) is designed following the WHO recommendations. The students in the study aged 8-10 come from areas near Turin. The intervention was organised over 15 meetings lasting 120 minutes each. There were five areas in these meetings; self-image (2 meetings), self-esteem (6 meetings), corporeity (3 meetings), active listening (2 meetings) and assessment (2 meetings). Each area had different activities. The intervention was implemented for one complete academic year. The targets were improvement in the development of self-worth and interpersonal relations. It is apparent that this study examines the social skills and self-esteem, which are two central concepts in our analysis.

The research design is a quasi-experiment in which a comparison group was established in the same rural district setting where treatment was introduced in the selected schools. The school administration decided the classes to participate in the programme. As the students and classes were not randomised and the pre-test baseline equivalence is not comparable between the groups so the difference in the effect size is considered only for the post-tests. The study has reported 4% student dropout and therefore scored with level 3 as having a comparison group and low attrition. We calculated the effect size of -0.41 which suggest that this programme could have negative impact on the desired outcomes.

Zippy's Friends

Zippy's Friends consists of 24 sessions for an academic year.The programme is built around a set of six illustrated stories, where Zippy is an insect and his friends are young children. The teacher reads a part of the story and the students are involved in activities such as discussion or drawing. There are various evaluation studies of the Zippy's Friends programme. We selected Clarke (2011) and Holen et al. (2012) because the reported data on attrition was clearly given in these studies. The study by Clarke (2011) recruited 44 schools and randomised them into three groups with on active control and the other business as usual. The initially recruited school sample had 44 schools and 766 students. At the post-test stage the student attrition rate is 39% (N=295). We scored 2 to 3 according to our criterion of rigorous research design and reported findings. The reported baseline equivalence is not balanced among the experimental groups as students in controlled group have higher scores in all of the six measures of non-cognitive skills. Student attrition rate is also very high so the reported impact of this programme is not convincing.

In the evaluation by Holen et al. (2012), the schools were matched and randomised in to treatment and control groups. Pretest was conducted for the baseline equivalence and the reported difference shows that the groups were balanced before the intervention was introduced. The post-test was administered after a year and the reported attrition is nearly 14%. We scored this study 3 to 4 as the research design is rigorous, reporting is clear for the samples recruited and included for the final analysis.

The evaluation conducted by Mishara and Ystgaard (2006) is not a randomised controlled trial, but it has a control group. In the current review only the Denmark sample is considered because it had included participants in the first grade, while the Lithuania sample included kindergarten students. The study does not report attrition in the samples. The matching between students in experimental and control groups is not also not clearly explained. We have scored this study 2 to 3 according to our judgment criteria. Zippy's Friends have mixed results and we could not make clear conclusion even we calculated the effect sizes for each of the evaluation study.

LIFT programme

LIFT (Linking the Interest of Families and Teachers) program is a collaborative intervention targeting the behavior of students in classrooms and home settings (Reid et al., 1999). Teachers and parents collaborate with each other on the assigned activities and give feedback on a child's behavior performance. The study invited 44 elementary schools to participate in the study but could recruit only 12 schools. The study included 762 students out which 12% declined to participate and 3% participated only in the school activities. The reporting includes detailed description of the actual intervention and each phases of the experiment but the assessment of the impact is not carefully recorded or perhaps recorded but not reported. The description of results is not adequate for making a fair judgment on the effectiveness of the program. The reported effect size is only about mothers' aversive verbal behavior, and children's aggression behavior levels in playground settings before and after intervention.

INSIGHT

The INSIGHT programme engages both students and parents in the attempt of improving the behaviour and social skills of students (McGlowry, Snow & Tamis-LeMonda, 2005). The schools were randomly assigned into treatment and active control

groups. There was a baseline assessment and repeated assessment during the same year to measure problems at home. There is a telephone interview with the parents every two weeks of the programme. The time point called 'time 5' does not have a big time lapse from the initial measurement. The assessment is based on occurrence of behavioral problems therefore negative effect means reduction of behavioral problem. At the baseline assessment, the INSIGHT group had more behavioral problems compared to the other group. The sample size was small and the final results were mainly suggesting regression to the mean effect. We scored this study 3 because the schools were randomised, the selected samples are fully reported, there is no attrition and full sample included in the final analysis.

PATHS

PATHS is a school-based intervention which promotes the social-emotional learning for students in the elementary schools. PATHS aims to give the opportunity to the students to label, understand and manage their feelings (Greenberg et al, 1995; Riggs et al., 2006). PATHS programme is recommended to be taught for two or more times per week for a minimum of 20 minutes and the material and sources varies (PATHS, 2012). PATHS have lessons such as labeling feelings, reducing stress and understanding other people's perspective (Humphrey, 2015). The targeted skills of PATHS programme are the emotional intelligence, self-esteem, self-control and the behaviour problems of the students (PATHS UK, 2015).

In the examined study, 2nd and 3rd grade students were randomly assigned between control and intervention group (Greenberg et al., 1995). Schools were randomised into treatment and controlled situation. This study is well-reported in terms of research design and group assignments. In our analysis, we included solely the sample and the post-test results from what the researchers are calling 'regular classrooms'. In different evaluation studies of this programme, we found consistent positive effects size.

Child Development Project

Child Development Project has three main classroom components; a) developmental discipline through decision making b) co-operative learning c) literature-based reading instruction. There are also two other components in the programme referring to parental involvement and the school as a whole, which should promote inclusion and the idea of a caring community (Solomon et al., 2000). The specific study was implemented for students Grades 3-6. The programme aimed to develop the social skills and relationships between the students, their motivation, autonomy (or what is called self-regulation in this analysis) and their self-esteem (Solomon et al., 2000).

The study included 24 schools (12 in comparison group) were matched. Total students in the schools are 15,523. However, the student survey sample was not collected from all year groups and the reporting is very unclear to make a judgment on students participated and those who completed the survey.

Positive Action

The programme is based on a Kit for each grade. The Kit includes different material, such as posters, games and worksheets. Each lesson takes approximately 15 minutes to be completed and each Kit includes approximately 140 lessons with materials for 30 students.

The most recent evaluation of Positive Actions included the sample of 14 schools in Chicago (Lewis et al. 2013). The schools were matched, so there were seven treatment schools matched with schools not receiving the intervention. Nevertheless, the reporting in the article is judged insufficient. At the wave -8 (sixth year of assessment) 80% of the initially recruited sample was lost. The final assessment could include 131 students out of 624 who initially participated. There is no opportunity to calculate effect sizes due to missing information such as reported means and standard deviation. It is crucial - particularly for studies which follow the same cohort for many years - to be reported properly, so conclusions can be reached about their effectiveness.

The Second Step Programme

The Second Step is a social and emotional learning programme which also aims at bullying prevention. The material and the training are commercially available (Committee for Children, 2016). Photo cards and videotaped stories are used in order to introduce key questions and stimulate questions. Depending on the grade, lessons last from 25-40 minutes and the students are involved in various activities such as practicing self-regulatory strategies and behavioural skills and role-playing (Frey et al, 2005).

The main advantage of this research (Frey et al., 2005) is the multi-assessment of the intervention. The researchers used teachers' reports, student surveys, individual interviews and observational assessment tools to reach conclusions about the success of the intervention. In the study, 11 schools participated and were assigned in to treatment and control schools. The duration of the intervention is two years in which 1,253 students were recruited initially. Post-test were conducted after a year of in which only 500 students could be included. This is 72% student drop-out which makes the findings not very convincing.

STAR project

STAR project is a project implemented for schools which participated in Head Start and it was a three years project in Oregon (US). Head Start is a project for early years (birth-age 5) in the USA. This study (Kaminski et al., 2003) invited 261 students to participate, but only 56% agreed. In the evaluation, there are three different intervention groups (Kaminski et al., 2003). There is an intervention group examining the classroom only and other groups with combination of classroom and home interventions. In this analysis, we focused on the results of school-based intervention group. The initial sample was 147 and by the end 50 students dropped out (34% could not be followed at the post-test stage). This study scored 2 to 3 because there is a comparator group and has reported attrition levels. However, the group relevant to the classroom base non-cognitive skills is very small and we could not identify the missing cases from this group. From the given results in the evaluation report we re-calculated the effect size and found positive results.

Tribes Learning Communities

Tribes Learning Communities is a project designed for elementary, middle and high school students. As a community, the students are expected to be supported and appreciated by their peers and their teachers (Tribes Learning Community, 2013). As

the name reveals Tribe is referring to a community intervention, as Tribe can be considered as a community larger than a team - a community which resembles a family and it creates the sense of belonging (Patrick, n.d.)

There are different evaluation studies of the Tribes Learning Communities programme. We focused on the trial which has included non-cognitive gains as the main outcomes of the programme. The study examined included both parent and teacher reports (Hanson et al., 2011). This is a randomized control trial in which teachers were assigned into treatment and control groups. Initially 166 teachers were recruited and after the randomization 13 teacher dropped out of the study. The sample included 2,309 students. However, at each phase of the evaluation there was drop-out due to non-response rate or lack of parental consents. The details of the evaluation are so confusing that it is almost impossible to see a clear difference between those who were in the intervention classes and those who were in controlled classes.

Caring School Communities

Shared community is one the common elements found in many programmes for the non-cognitive skills improvement. Caring School Communities is another popular programme based on the idea of classroom as a shared community (Battistich et al. 1997). The students are given the opportunity to collaborate with others and to give and receive help. Moreover, the students reflect on their own feelings and behavior share their perceptions of feelings and behaviors of others in the community.

The teachers in the Caring School Communities aspire to develop the social, emotional and ethical skills of their classroom. Even though according to Battistich et al. (1997), the ethics and the democratic values and the altruistic behaviour can be interesting attitudes to be examined, in this analysis we put only other elements at the spotlight, such as the social skills of the students and their collaboration with each other. The specific study was implemented in three elementary schools. The main advantage of the study is the longitudinal design. The same students were followed for seven years from their start of the school until their departure on sixth grade. The measurement tools, however, is only self-reported questionnaires (Battistich et al., 1997). Even though the internal validity of the study appeared good, this is an example of the programme whose reporting is not adequate to allow calculation of effect sizes. Therefore, this programme will not be included in the discussion section.

Mindfulness Education Programme

Mindfulness in Schools has been established as a non-profit organisation by Richard Burnett and Chris Cullen and its curriculum was initially started for 11-18 years old students, but then it was created a curriculum for 7-11 years old students (Mindfulness in Schools Project, 2016a). The curriculum involves quieting the mind by sitting in a comfortable position and listening to a single sound. Then, the students focus on their breath, thoughts and sensations (Schonert-Reichl & Lawlor, 2010). Mindfulness is increasingly becoming a popular intervention in English primary schools and there is a lot of anecdotal evidence on the positive effects of this programme on children's social emotional health and wellbeing.

The selected study is a quasi-experimental study and the researchers measured different non-cognitive gains to the students attending 4th-7th grade in 12 schools. There was

matching done between the intervention and the control group and the unit of matching was the overall classroom characteristics. The researchers used the Resiliency Inventory, which would give results about the resilience, the self-efficacy and emotional control of the students before and after the programme. The study reported that 82% of the student sample got parental consent to participate in the study out of 300 targeted samples. Student drop-out by the end of this programme not mentioned and the reported results do not include any baseline equivalence of students. We scored this study 2 to 3 because it has a comparator group, the sample size is good and there are measures taken to prevent programme diffusion effect. However, it is not a random allocation of teachers or students, pre-test scores are not included and student drop-out rate is also not mentioned. We re-calculated the effect size from the study which met our criterion and found positive impact. However, the evaluation is not robust to draw conclusions.

Student Success Skills

Student Success Skills is a programme focused on academic and social competence of the students. It is a structured school-based intervention as described by Webb and Brigman (2006). In the beginning all students follow same goals and strategies for improvement. The middle of each lesson introduced different activities according the . The targeted skill is the success of the students, but as it is obvious from the description of the programme, this success is not only academic, but also social and emotional development.

Webb et al. (2014) evaluated the same programme by having a large student sample (N= 4,321) and random allocation of schools (30 treatment and 30 control). However, the study could not be found in any of the databases to be downloaded for a detailed description of the samples, group allocation methods, results and findings.

Social Skills Improvement System - Classwide Intervention Programme

The Social Skills programme as the name explicitly suggests aims to develop the social skills of students and reduce the behavioural problems in the classroom (DiPerna et al., 2014). The specific study (DiPerna et al., 2014) was implemented in first and second grade students in Pennsylvania. The curriculum lasts 12-weeks and aims to teach 10 different social skills in units of three 20 minutes lessons: listening to others, following directions and classroom rules, ignoring peer distractions, asking for help, talk in a conversation, cooperate with others, control anger, act responsibly and kindness (Institute of Education Studies, n.d.).

This evaluation is a classroom randomised control trial in which 39 classes were divided in to intervention and business as usual groups. Baseline equivalence was established on the measures which shows that the groups were fairly balanced. The study includes a diagram (p. 131) with mentioned attrition. The number of students who declined to participate is also mentioned. There is very least number of student drop–out at the end of the programme. We scored this study 4 to 5 and our recalculation of the effect sizes also confirmed positive impact of this programme.

Rochester Social Problem Solving

The Rochester Social Problem Solving programme was implemented in the 3rd and 4th grade in two schools in the South Australia (Sawyer et al., 1997). The programme lasted for 20 weeks and had 34 lessons. The students were taught social skills and how these affect feelings and behaviour. Furthermore, when a real-life situation occurred, there was a classroom discussion based on the programme content.

The study relatively has a small sample (N= 188) and non-randomised group allocation. There were only classrooms from two schools participating in the study allocated in to treatment and control conditions. The schools were matched based on the basis of area socioeconomic measures. However, there is a follow-up that enables us to calculate final effect sizes after a year of the implementation of the programme and the well-reported results with different measurement tools. The student drop-out at the follow-up stage is 31% (N=58). Pre-test scores of students show that the baseline equivalence was not balanced between the two groups. We have scored this study 2 to 3 because it has a comparison group and reported pre and post-test differences. The effect size was calculated from the cores mentioned in the study and were positive.

Philosophy for Children

Philosophy for Children encourages students to dialogue in the classroom, to think and reflect together, to justify their beliefs and ideas, to develop appropriate language for a dialogue and argumentation, and to become aware of their capacity for discussion (Blinded for review, 2016). There are some studies which examined the impact of this programme on non-cognitive skills. Williams (1993) examines the Philosophy for Children impact on intellectual confidence and reasoning skills of students in secondary schools. The reported results are promising in terms of raising students' confidence. However, student attrition rate is not reported. This study is excluded because it is on secondary school samples. Fair et al. (2015) conducted evaluation in Texas and they have a three-years follow up. However, this meta-analysis does not inspect the interventions for students in the middle school.

A recent study on P4C has been conducted on primary schools in England (Blinded for review, forthcoming). The study is a matched group design in which students on P4C were compared with students in the same age group but not given P4C. The reported attrition is 10% of the total sample initially recruited (N=2,722). The preliminary findings have shown that P4C is a promising intervention to improve students' social communication skills, cooperation and team work. The effect size was positive according to our calculation.

Discussion

Some studies investigate the emotional and social skills are sometimes examined as a single unit. For instance, the Mindfulness Education Programme presented the combined emotional-social competence. It could be argued that a separate reporting would lead to a better understanding and judgment of the effectiveness of the study. On the other hand, even though Brunello and Schlotter (2011) argued that the non-cognitive skills are usually measured by self-reported questionnaires, the table reveals that the teacher reporting seems to be equally popular as a measurement tool.

There are some interventions with negative effect sizes but the negative results were the desired outcomes of the interventions. The intervention included in WHO recommendations shows slightly negative effect of the treatment of children. However, these results mean reduction of the adverse outcomes such as disruptive or aggressive behavior. INSIGHTS programme has negative effect size and the results have shown slight reduction of the behaviour problems at home. However, the INSIGHTS treatment group at the baseline also had more behavioral problems as compared to the comparator group. The effect could be due to regression to the mean.

The findings for Zippy's Friends intervention are contradictory. Holen et al. (2012) present findings in which the programme does not show any effectiveness. However, there is another study which supports that Zippy's Friends have negative effect size (Mishara & Ystgaard, 2006), while the Clarke (2011) suggests a slight positive effect size. We reexamined the results achieved from various studies and concluded that the interpretation of the results of the Clarke (2011) should be done cautiously. Children in control group were slightly ahead at pre-test in all the measures (Clarke, 2011, p. 116). This suggests a slight bias towards selecting children for the intervention and the effect sizes a. Consequently, by combining the evidence on the intervention it appears that Zippy's Friends is not an effective intervention.

Philosophy for Children and Rochester Social Problem Solving project have low effect sizes. With reference to the Rochester Social Problem Solving programme, the study reports both parent and teacher assessments. The effect sizes deriving from the parent reporting appear to be slightly bigger. There are researchers who have claimed that it is possible for the teachers' assessments to be more objective than the parental assessment of child's behaviour (Carneiro, Crawford & Goodman, 2007).

Social Skills Improvement System - Classwide Intervention Programme, RULER and PATHS appear to have low to medium effect sizes. Concerning the RULER study, the interpretation of the effect size cannot lead to solid conclusions. In the adaptability scale, the study skills are also included. Since this scale cumulates the social skills, self-regulation and study skills by using the same skill, the effect size on non-cognitive skills is not represented by the number in this table. PATHS have low effect size, except of the emotional literacy of the students. This finding, though, is not surprising. The intervention group has been taught to label feeling during the interventions, as the PATHS curriculum suggests. Therefore, it is expected that the intervention group performs better in giving definitions of emotions. It could be supported that it is somehow like have taught the students in advance the content of the assessment. The treatment group is disadvantaged on this task, as it has not been involved in a similar task before.

Additionally, there are two interventions which have medium effect sizes and seem to be effective. These two studies are the STAR intervention and the Mindfulness Education Programme. The STAR project is combined with the Head Start. The medium effect size can be a positive indication that an intervention starting from the Early years and involves co-operation with the families can bring positive results. The sample size should be considered. It has been supported that studies with small samples usually have bigger effect sizes (Gorard & Gorard, 2016, p.483). Concerning the Mindfulness Education Programme, teachers reported implementing the programme

75% of the time. What is more important is the frequency of implementation. The teachers implemented the activities, three times per day for nine weeks. None of the other interventions had such a regularity. If the medium effect size is interpreted based on the frequency of the sessions, then there could be two explanations. It is possible that the frequency of the Mindfulness Education programme plays positive role in non-cognitive skills of the students. On the other hand, it is possible that the regularity of the programme led to immediate and pronounced impacts which is a good element of the programme. The Mindfulness Education Programme does not have an extensive follow-up. There is no evidence about the effect of the programme on a longer-term basis. Moreover, in absence of pre-test results it is not possible to see if there was baseline equivalence.

As a result of interventions there could be immediate effects in these skills but there were no follow up studies conducted that could show how long these effects last after the intervention period is over. There are also some studies, such as the Positive Action research, which has a sufficient length of intervention, but a poor reporting.

Finally, this systematic review does not enable the establishment of causal relationships between specific effective characteristics of the interventions and the improvement of the socio-emotional skills. There are no specific elements in school-based interventions which are clearly linked to the improvement of socio-emotional skills. Even though some interventions have specific elements, such as the parental involvement in the STAR project and the frequency of implementation during the Mindfulness Education programme, the research findings do not suggest a causal effect between the presence of these elements and the improvement of students' socio-emotional skills. Since there is a control group, it is possible to claim that the positive effect sizes in the intervention group are caused because of the implementation of the intervention. However, the research design does not isolate and control specific characteristics within the interventions.

Conclusion

In the bibliography, there are several studies that reported findings on the interventions that aimed at improvement of non-cognitive skills. Some of these interventions appear to have similar characteristics. For example, there are interventions which attempt to develop a sense of community creating a classroom or a school community, such as the Child Development Programme, Tribes Learning Communities, Caring School Communities. Another example could be the group of interventions which suggest labeling feelings, such as RULER, Zippy's Friends, PATHS, Caring School Communities.

The majority of the studies target to improve the social skills of students. There might be two reasons for this. First, the social skills are more important for teachers, because their improvement will lead to the solution of important school problems, such as bullying. Second, the social skills can be considered more observable compared to skills such as motivation, self-control and self-esteem.

Five studies have rigorously evaluated the programmes and the findings are trustworthy (DiPerna et al., 2014; Holen et al., 2012; Lemma et al., 2012; McGlowry, Snow & Tamis-LeMonda, 2005; Authors, forthcoming). However, the results on improvement

of the non-cognitive skills are mixed. Two of these studies have reported negative results of the programmes evaluated (Lemma et al. 2012; McGlowry, Snow & Tamis-LeMonda, 2005) while two studies have shown slight improvements in students emotional regulation, social communication skills, cooperation and teamwork (Holen et al 2012; Authors, forthcoming). The strongest findings of the study report improvement in social skills, cooperation, assertion, self-control and engagement (DiPerna et al., 2014).

We base our recommendations on this systematic review process and results. For the future studies we recommend rigorous reporting of the samples targeted and included in the final analysis. The reported facts about the outcomes should be stated as such that a re-analysis can be conducted. We also recommend rigorous follow-up studies of the interventions that have repeatedly shown immediate positive results. If these interventions have positive and long terms outcomes then school education policy could incorporate student well-being as an important measure.

To conclude, the existing evidence suggests that short-term school-based interventions can make a slight difference on non-cognitive skills of students having low to medium level effect sizes. Our results are encouraging and they support implementation of programmes for the improvement of the non-cognitive skills for their own sake rather than for targeting academic attainment or assessing school performance based on these measures.

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TABLE 2

Calculated effect sizes Cohen d and r based on Samples, Means and Standard Deviations of Intervention (I) and Control (C) group post-tests.

Intervention	Study	Non-cognitive Skill measured	Sample (I)	Sample C)	Total	Intervention dosage	Measures	Mean (I)	Mean (C)	SD (I)	SD (C)	Drop outs	Effect size d	Effect size r	Follow-up	Score
RULER	Bracket et al. (2012)	Social skills and self-regulation (adaptability)	155	118	343	1 year	Teacher reported	54.27	43.88	21.43	19.4	Not reported	0.50	0.25	No	2 to 3
WHO	Lemma et al. (2012)	Interpersonal Relations (social skills)	138	153	291	1 year	Student self-reported	73.96	78.71	11.8	11.1	12 (4%)	-0.41	-0.20	No	3
		Emotional well-being						77.34	81.83	12.3	10.9		-0.38	-0.19		
		Self-Worth						3.14	3.23	0.6	0.6		-0.15	-0.08		
Zippy's Friends	Clarke (2011)	Total Emotional literacy	248	87	766 (44 schools)	1 year	Teacher reported AND student self-reported	66.32	64.37	11.5	9.7	461 (38%)	0.17	0.09	12 months follow-up.	2 to 3
		Self-regulation	254	88				12.84	12.19	3.4	3.1		0.19	0.10		
		Motivation	252	89				12.54	11.69	3.3	3.1		0.26	0.13		
		Social skills	255	89				14.36	14.39	1.9	2.1		-0.01	-0.01		

	Holen et al. (2012)	Active/Emotional Regulation	640	631	1485	1 year	Student reported	0.882	0.869	0.16	0.19	214 (14%)	0.07	0.04	No	3 to 4
	Mishara & Ystgaard (2006)	Co-operation	322	110	432	24 weeks	Student reported	2.50	2.56	025	0.25	Not reported	-0.24	-0.12	No	2 to 3
		Self-control						2.16	2.27	0.28	0.28		-0.39	-0.19		
		Assertion						2.34	2.40	0.25	0.23		-0.24	-0.12		
INSIGHTS	McGlowry, Snow & Tamis-LeMonda (2005)	Behaviour problems at home	57	91	148 (5 schools)	10 weeks	Parent reported	4.48	6.02	4.8	4.2	No drop out	-0.34	-0.17	No	3
PATHS	Greenberg et al. (1995)	Feelings Total Definitions (emotional literacy)	83	109	192 (4 schools)	Approximately one year	Student reported	5.8	4.7	1.9	2.0	Not reported	0.56	0.27	No	2 to 3
		General feelings questions Are all feelings OK?						0.86	0.81	0.4	0.4		0.12	0.06		
		Knowledge of self						1.84	1.67	0.7	0.7		0.24	0.12		
		Knowledge of others						1.53	1.38	0.4	0.5		0.33	0.16		
STAR	Kaminski et al. (2003)	Social Competence	12	33	147	5 months	Teacher and parent reported	0.18	- 0.25	0.52	0.82	50 (34%)	0.58	0.28	3 years follow-up	2 to 3
		Self-regulation						0.02	- 0.08	0.68	0.82		0.13	0.06		

Mindfulness Education Programme	Schonert-Reichl & Lawlor (2010)	Social-emotional competence	139	107	246	10 weeks	Teacher reported	3.449	2.989	0.45	0.18	Not reported	1.29	0.54	No	2 to 3
Social Skills Improvement System - Classwide Intervention Programme	DiPerna et al. (2014)	Social skills (composite)	258	221	479	10 weeks	Teacher reported	2.39	2.14	0.47	0.57	10 (2%)	0.49	0.23	No	4 to 5
		Cooperation						2.28	2.02	0.63	0.70		0.39	0.19		
		Assertion						2.23	2.04	0.55	0.60		0.33	0.16		
		Engagement						2.49	2.17	0.52	0.65		0.54	0.26		
		Self-control						2.38	2.15	0.58	0.67		0.62	0.37		
Rochester Social Pr. Solving	Sawyer et al. (1997)	Social and emotional skills	71	59	133	20 weeks	Teacher reported	19.5	16.1	22.5	16.3	58 (31%)	0.17	0.09	1 year follow -up	2 to 3
		Social and emotional skills					Parent reported	24.5	20.0	17.7	14.8		0.27	0.14		
Philosophy for Children Programme	Authors (forthcoming)	Social and communication skills	968	1469	2722	1 year	Student reported	6.25	6.00	2.58	2.29	285 (10%)	0.10	0.05	To be followed up (for a year)	3
		Cooperation and team work						7.16	6.75	2.78	2.76		0.15	0.07		